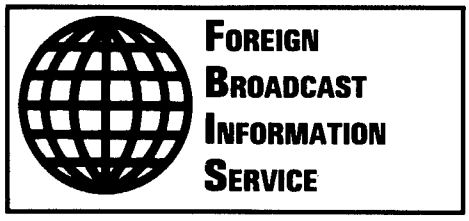
JPRS-TTP-88-006
9 MAY 1988



JPRS Report

Telecommunications

Telecommunications

JPRS-TTP-88-006 *9 MAY 1988*

CONTENTS

BELIZE

ST LUCIA

NEAR EAST & SOUTH ASIA

INDIA

PAKISTAN

WEST EUROPE

ITALY

NORWAY

Cabinet Role in Regulation of CRTC Debated

55200030 Toronto THE GLOBE AND MAIL in English 28 Mar 88 p B4

[Article by John Partridge: "CRTC Chairman Speaks Against Cabinet Review"]

[Text] It's a simple proposition, says Andre Bureau, chairman of the Canadian Radio-Television and Telecommunications Commission.

If the CRTC makes a mistake, the courts, not the federal Government, should fix it. But if the Government isn't satisfied with the direction in which the regulator is moving, it should fire the chairman and commissioners.

Mr. Bureau dispensed this maxim last week to a sell-out crowd of about 200 lawyers attending the opening session in Toronto of a two-day symposium on communications law presented by the Law Society of Upper Canada.

He was laying out his views of the appropriate relationship between the Government and the CRTC.

Those views are not new, but Mr. Bureau expressed them in a forceful manner that provoked lively debate with other panel members and with the audience.

In essence, he said the Government's current power to review commission decisions should be abolished, and any appeal should be handled by the courts.

This is partly because the Cabinet appeal process is secret and does not give all interested parties the chance to state their positions and is therefore "unacceptable," Mr. Bureau said.

But it is also because, if the Government has the power both to issue policy directives to the CRTC and then review its decisions, "there may well develop a public perception that the commission...looks over its shoulder on every decision it makes—in short, that the commission has ceased to be an independent agency."

In addition, Mr. Bureau said, although the Government should continue to have the power of policy direction, this power should be limited. It should be restricted to broad policy matters and be prospective, not retroactive.

Just as important, he said, policy directions should always be preceded by "a real and compulsory consultation process" conducted by either the CRTC or any body the Government might consider more "apt."

Quebec Minister of Communications Richard French, another member of the panel, agreed with Mr. Bureau that governments should confine themselves to policy direction, if for no other reason than that it would become increasingly difficult to attract "people of quality" to regulatory jobs—"an even more thankless role than the political one"—if they think politicians will have "not only the first word, but also the last."

Mr. French said he had recently tabled new communications legislation in which Quebec "foreswore the power of review in favor of direction."

But he strongly disagreed with the CRTC chairman about the notion of tacking on an extensive, statutory consultative process to the power of policy direction.

That, he said, would "lead inevitably to directives that are really regulations, a searching set of norms and proscriptions that would amount to converting a regulatory agency into something much closer to an administrative tribunal."

The view from the other side came from panel member Wes Scott, executive vice-president of telecommunications giant Bell Canada, a unit of BCE Inc. of Montreal, which last week lost a bid before the CRTC to raise local telephone rates this year.

Mr. Scott contended that the Government should retain not only its right to issue policy directives to the regulator on telecommunications issues—although only in exceptional cases such as matters of national interest—but also its power to review, rescind or vary commission decisions.

"The Government, as the elected guardian of the public interest, should have the final say," Mr. Scott concluded.

/06662

Bell Canada Seeking More Regulatory Freedom

55200029 Toronto THE GLOBE AND MAIL in English 7 Mar 88 p B8

[Article by Ben Fiber]

[Text] Bell Canada is asking the Government to recognize its dual role as a telecommunications monopoly and a business competitor.

The company has asked the Canadian Radio-Television and Telecommunications Commission to let it bypass the formal application process generally required either to change the rates on its business services or to launch new ones.

The fear is that rival CNCP Telecommunications Ltd.—which was freed from these controls on a number of its product lines last month—will now give Bell unfair competition because it will be able to spontaneously cut prices or offer new enhanced services.

Bell, the giant telephone utility that is a unit of BCE Inc. of Montreal, is also concerned about competition from Telesat Canada and from other, smaller providers of enhanced telecommunications services.

CNCP's exemption has created "unfair and inequitable" market conditions, said Gary Bray, Bell's vice-president of government and regulatory affairs.

The new regulations have placed Bell "at a significant disadvantage" in relation to CNCP while also reducing the competitive environment for its customers, Mr. Bray said.

Bell is seeking regulatory freedom for a number of its existing business services, including Envoy 100, an electronic message service; Voicecom, a voice telephone network with a single-button, "hot line" between callers; and INet 1000, an electronic service that enables computers to connect with large data bases.

CNCP operates a number of services that are roughly similar to those offered by Bell. They include Infoswitch, a pay-as-you-use shared phone line for data communications networks; Infodat, a pay-by-the-month private line for such networks; and WP Mail, an electronic message service.

In the new regulatory environment, "competitors will be able to launch new services with certainty" while "we will be forced to wonder whether we are even going to get regulatory approval," said Denise Sarazin, a spokesman in Bell's corporate relations department.

/06662

First Communication Satellite Still Functioning

OW180738 Beijing XINHUA Domestic Service in Chinese 0754 GMT 6 Apr 88

[By reporter Xu Zhimin]

[Text] Beijing, 16 Apr (XINHUA)—According to an official of the Chinese Institute of Space Technology, China's first experimental communication satellite is still functioning normally, exceeding its designed life span by 1 year. This shows that China has achieved a significant technology breakthrough in ensuring the quality of the geostationary communication satellite as well as in using and managing it.

According to the official, the satellite was launched on 8 April 1984. After accomplishing all its experiments on 16 April 1987, the satellite, which was expected to last 3 years, is still handling remote areas' communications and sending in water conservancy and power information, as well as relaying telephone calls, radiophotos, and numerical information. Recent tests of the satellite by its designers showed that its 30,000-strong electronic components were functioning reliably, and its temperature control, tracking, remote sensing, and power supply systems were working normally. During the past 4 years the satellite has accumulated for China useful experience in designing, testing, launching, and controlling a new generation of communication satellites.

Satellite Begins Television Transmission

HK160702 Beijing CHINA DAILY in English 16 Apr 88 p 3

[By Zhang Ping]

[Text] Shanghai—China's own communications satellite began transmitting television programmes yesterday afternoon, thus ending the country's reliance on international satellites for transmissions.

"This indicates that China has now become one of the few countries in the world which is able both to launch a communications satellite and transmit TV programmes via the satellite," said Zong Ruhou, chief engineer at the Shanghai-based No. 1 Research Institute of the Ministry of Post and Telecommunications.

Zong told CHINA DAILY that, starting from next year, China will no longer need to rent the international communications satellite in order to transmit TV programmes.

But during the current transition period, he said, programmes will be transmitted by both the Chinese satellite and the foreign one above the India Ocean.

Yesterday afternoon, television programmes on three channels were transmitted via China's third practical communications satellite launched on March 7 from the Earth Station in Urumqi, capital of Xinjiang Uygur Autonomous Region.

Xinjiang Ground Station Operating

OW181058 Beijing XINHUA Domestic Service in Chinese 0730 GMT 16 Apr 88

[Text] Urumqi, 16 Apr (XINHUA)—The No 2 earth station in Urumqi, which will transmit television programs on three channels from China's telecommunications satellite, went into operation on 15 April.

The telecommunications satellite, which successfully moved into its geostationary orbit on 22 March, differs from ordinary telecommunications satellites of other countries in that its radiation power concentrates on China's mainland territory and that its signals sent to earth are stronger than those beamed by satellites of other countries. Thus, television signals of similar quality can be received in various areas in China with relatively smaller antennas, thereby reducing the cost of construction of receiving stations and improving reception of the nearly 5,000 television receiving stations scattered in various areas of China. According to receiving stations in Beijing, Shijiazhuang, Shanghai, Guizhou, and Xian, the picture and sound of TV programs received on a trial basis were clear, and color tones were normal.

Programs One and Two of the Central Television Station and TV programs of the Station Education Commission transmitted via China's telecommunications satellite will be telecast throughout the country beginning from 20 April by earth station No 2 in Urumqi.

Communication Satellite Commissioned 20 Apr

OW201338 Beijing XINHUA Domestic Service in Chinese 1125 GMT 20 Apr 88

[By reporter Xu Zhimin]

[Text] Beijing, 20 Apr (XINHUA)—According to the Ministry of Posts and Telecommunications, China's newly launched communication satellite was officially commissioned for practical use today. In addition to being used to relay the three sets of programs broadcast by the Central Television Station, it also provides relevant departments satellite telecommunications services.

The communication satellite, which was successfully launched on 7 March, passed a series of technical tests of its capacity for transmitting signals while in the orbit. Test receptions conducted in Beijing, Shijiazhuang, Shanghai, Guiyang, and Xian show that the satellite can transmit clear images, lifelike colors, and good audio. The retransmitter on the satellite is functioning normally, and all other technical indexes meet application requirements.

As the satellite is equipped with a formed beam antenna [CHENG XING BO SHU TIAN XIAN 2052 0992 3134 2631 1131 4848], which can focus the radiation power primarily on China, its signals are noticeably stronger than those of international satellites, thus satisfying China's current needs in satellite communication and the transmission of the Central Television Station's programs.

Communications Satellite Begins Transmitting TV

OW201754 Beijing XINHUA in English 1715 GMT 20 Apr 88

[Text] Beijing, April 20 (XINHUA)—China's telecommunications satellite lauched March 7 officially started operation today with the nationwide transmission of three channels of programming from China Central Television.

According to the the Ministry of Posts and Telecommunications, the images were clear with good color and sound during trial reception in Beijing, Shijiazhuang, Shanghai, Guizhou and Xian.

According to experts, a beam antenna allows the satellite to focus its transmission power on China's territories so the signals are much stronger than those emitted by international satellites, and reception at China's 5,000 ground stations has greatly improved.

Now receivers with antennas of three to 4.5 meters in diameter are able to achieve the same effects of the previously-used six-meter receivers, and television programming picked up in the remote areas of the Tibet and Xinjiang Uygur Autonomous Regions are as clear as anywhere else in the country.

The new satellite has not only doubled the capacity of the Chinese telecommunications statellite launched in 1986, but also has a lifespan of one and half years longer.

To allow existing ground stations enough time to upgrade antennas to handle transmission from the new satellite, the Ministry of Posts and Telecommunications has decided to use both an international satellite and the Chinese satellite until the end of this year.

The new satellite will also handle domestic telephone communication service.

New Satellite Control System Completed

OW211228 Beijing XINHUA Domestic Service in Chinese 0732 GMT 21 Apr 88

[By correspondent Jiang Dong]

[Text] Shijiazhuang, 21 Apr (XINHUA)—A new-generation astronautical survey and control system, which is mounted on a motor vehicle, passed performance appraisal here recently.

It is reported that the system will be used in the survey and control of a new-type satellite to be launched by China in the near future.

According to experts, the system is of the world's technological level of the 1980's. It is a product of advanced technology with multiple functions. As its component units do not need operators, the whole system requires only two or three persons to operate.

The system was developed by the No 54 research institute of the former Ministry of Electronics Industry.

Official Views Communication Satellite Plans

OW260501 Beijing XINHUA in English 1429 GMT 25 Apr 88

[Text] Beijing, April 25 (XINHUA)—A satellite communications network, bigger TV coverage and improved telephone services are the achievements China has made in the spread of satellite communications technology.

This technology has become an important means to transmit telephone calls, data and television and radio programs, and photo and written facsimile, a State Council official said here today.

The number of ground satellite stations across the country has risen from 53 in 1985 to 5,000, which are now staffed by 10,000 technicians.

China's domestic satellite communications network started recently and a satellite data communications system will open on a trial basis soon.

One Chinese-launched communications satellite transmits two channels of TV programs and one education channel every day from the Beijing-based Central Television Station.

China now has more than 100 million TV sets.

There are also nearly 1,000 international lines which operate via satellite. Direct dialling telephone services via satellite are available between China and 30 countries including Canada, France, Japan, and the United States.

One hundred telephone circuits via satellite have been opened in China to form a long-distance communications network.

Official Discusses Satellite Developments

HK032788 Beijing LIAOWANG in Chinese No 14, 4 Apr 88 p 22

[Article by Zhang Chunting (1728 2504 0080) and Sun Minqiang (1327 3046 1730): "Sun Jiadong, Vice Minister of Astronautics Industry, on New Developments in China's Communications Satellites"]

[Text] On 7 March 1988 China successfully launched another practical communications satellite which, after being remotely measured and controlled by scientists and technicians from the ground for over 10 days and nights, was fixed at 87.5 degrees east longitude at 1302 hours on 22 March. In an interview the other day with Sun Jiadong, Vice Minister of Astronautics Industry and noted satellite expert who had just returned from the satellite launching, measuring, and controlling site, we asked him to talk about the new successes scored in the launching of the satellite.

Facts Have Again Proved the Stable and Reliable Performance of the "Changzheng No 3" Carrier Rockets

Vice Minister Sun Jiadong said: The successful launching of the practical communications satellite has again forcefully proved the stable and reliable performance of China's "Changzheng No 3" rockets. Although we had made careful and thorough preparations before the launching, we were still on tenterhooks. It was our third consecutive success in launching the "Changzheng No 3" rocket. It has further strengthened our confidence in using the rockets to launch various applied communications satellites. Internationally, because we have rarely launched communications satellites in the past, perhaps people have some doubts about the performance of our "Changzheng No 3" rockets. Our current success has undoubtedly helped increase people's confidence and, therefore, will be even more conducive to the entrance of the "Changzheng No 3" rockets to the international market in the service of international users. Like our "Changzheng No 2" carrier rockets, our "Changzheng No 3" carrier rockets will certainly win higher prestige in the world.

China's Ground Telemetering and Remote Control Technology Is Becoming Increasingly Perfect and Mature

After a short interval, Vice Minister Sun Jiadong added: The launching success also shows that our ground telemetering and remote control technology is becoming increasingly perfect and mature. Viewed from the time conditions, to use a professional parlance, the "launching aperture" of our Xichang Launching Center was very narrow, lasting for less than 2 hours. It was indeed not so easy to make all preparations in such a short time and to launch the rocket accurately and correctly. The launching of the rocket at 2041 hours on 7 March and the entrance of the satellite into a quasi-synchronous orbit at 0948 hours on 9 March lasted for only a little over 37 hours. Moreover, Chinese cosmonautic scientists and technicians only had less than half of the 37 hours to measure the satellite. This is because China relied only on the few surveying centers in the country and the two surveying ships temporarily sent to somewhere near the equator in the Pacific to measure the satellite and, when the satellite turned to the back of earth, the Chinese scientists and technicians could not measure it. In the 10-odd available hours, the Chinese scientists and technicians were able to immediately spot the extremely small satellite revolving in the 40,000-km outer space and speedily and accurately measured its positional angle and to order it to make appropriate adjustments. Meanwhile, they also immediately ordered that the remote engine be ignited so that the satellite could smoothly move from a big oval orbit to a quasi-synchronous orbit of the earth. This shows that the telemetering and remote control technology of China's ground measuring and control center has a very high degree of accuracy.

Sun Jiadong said: The practical communications satellite's engine was remotely ignited over the equator at 146 degrees east longitude. It drifted westward and then entered a predetermined fixed position over the equator at 87 degrees east longitute. It took only 13 days to move 58.5 degrees. This also shows that the designing of the satellite orbit and procedure is economical, rational, and very accurate. There have been neither deviations nor roundabout courses. Naturally, we had worked out several tentative plans and prepared ourselves for several eventualities before the launching. We have achieved the best plan.

Talking about the improvements made in the practical communications satellite in comparison with the last satellite, Vice Minister Sun Jiadong said: The data received from the satellite after the launching shows that all the instruments and equipment in the satellite have been functioning normally and that the transmitted telephone and television results are better than those in the practical communications satellite launched on 1 February 1986. To be more specific, there are the following points:

1. The life span of the satellite will be 50 percent longer that of the last satellite. The working life span of a satellite is determined by the energy it carries. We have adopted a brand-new, reliable device for the energy equipment of this satellite. Therefore, the designed life span of this satellite will be longer than that of the last satellite (which is 3 years) by 1 and 1/2 years.

2. The communications volume is much higher. The number of its transmitters is 100 percent more than that in the last satellite and the number of communication lines increases by 200 percent. Besides, the quality of the transmitted telephone and television has also markedly improved.

3. The satellite's radiation power to the ground has also slightly increased. Because of the increased power, we now only need a ground reception station with an antenna 3-4 meters in diameter, whereas in the past we had to install an antenna with a diameter of 4.5-6 meters. Moreover, following the higher precision of the satellite's fixed point, the position of the satellite is more stable, making it unnecessary for a ground accepting station to install an expensive track antenna. For this reason, the structure of the ground station can be simplified and the building cost can also be reduced. This will play a considerable role in popularizing ground stations, quickening the construction of television receiving networks, and improving the social effects and economic results of communications satellites.

In conclusion Sun Jiadong said: After fixing the position of the satellite, we shall conduct orbital measurement tests for another 20 days. The satellite will probably be made available to the users in mid-April.

HONG KONG

Australian Computer Group Moving Headquarters Here

55400040a Hong Kong HONGKONG STANDARD in English (Business) 19 Feb 88 p 1

[Article by Divina Yumol]

[Text] Computer Power, one of Australia's top computer services groups, is moving its Asian head office from Singapore to Hongkong as the first step in a major expansion into the markets of northeast Asia.

Asia region managing director Chia Yen On said the decision to transfer the Asian headquarters was the result of the rapid expansion of the company's business here, leading to a need for additional management resources.

"We have a stable organisation and management structure in Southeast Asia and we have a strong customer base," he said.

He added that the company was also looking at the possibility of expanding to Japan and Korea where it intended to build on existing business relationships.

"Hongkong is the natural base from which to open up these new markets," he said, adding that the company had already started negotiations with a Chinese company which could help set up the business in these countries.

Computer Power's business lies partly in software sales and partly in providing professional services to larger computer users in complex areas such as operating systems, networks and data bases.

The professional services operation is based in Hongkong but operates on a regional level. It recently completed a major project for a petrochemical company in Thailand and is currently working on other projects here, in Singapore, and Kuala Lumpur.

The company is also active in Taiwan, where it has sold a text storage and retrieval system to the National Science Council. Following the sale, a joint development team upgraded the software's Chinese language capability.

A new business area that has been opened up by the company is computer education. Last year, Computer Power bought Australian based Management Technology Education. It is now planning to extend its offerings throughout the region.

The group employs 27 people in Hongkong with major customers including the Royal Hongkong Jockey Club, Standard Chartered Bank, Citibank, Dow Chemical, Barclays International and the Hongkong Government.

/9274

Hong Kong in Joint Venture for Asian Satellite System

PCR, UK Roles

55400036 Hong Kong SOUTH CHINA MORNING POST in English 24 Feb 88 p 1

[Article by Chan Chi-keung]

[Text] A joint venture linking Li Ka-shing's Hutchison group, British telecommunications giant Cable and Wireless and China International Trust and Investment Corporation will launch Asia's first domestic communications satellite by early next year.

And satellite television transmission to China and the region is one of the possible developments once the satellite is in orbit and operational.

The three equal partners will today announce an $800 million-plus venture in which a refurbished second-hand Westar 6 communications satellite will most likely be launched in China by a Chinese Long March rocket.

Hutchinson Whampoa's group managing director, Mr Simon Murray, said yesterday the satellite would have a working life of eight years which allowed scope for development beyond its initial role in providing telephone services, data transmissions and telemetry.

"It will cost a lot to get it get up and working, but it's like investing in real estate—income can be generated during the life of the property," he said.

The project signifies a major penetration of the Hutchison group into the mainland's communications business and a great leap forward for the group as a whole.

The group's participation is through its wholly-owned subsidiary Hutchison Telecommunication and CITIC's role will be taken by its technology arm, CITIC Technology Corporation.

It is likely that Hutchison will be mainly responsible for the marketing with C and W providing the technological expertise and the Chinese partner the necessary finance and connections in China.

Mr Murray recently pointed out that telecommunications would be a strategic development of the Hutchison group.

A Hutchison spokesman said many decisions had yet to be made, including the choice of rocket and the appointment of an insurer.

Alternatives to the Long March rocket, provided by China's Great Wall Enterprises, would be the French-made TAN rocket or the American Space Shuttle.

However, China has recently taken advantage of setbacks in the West's satellite program to promote the use of its satellite launching capabilities to Western companies for civilian purposes.

Timing was also an important factor, the spokesman said. The Westar 6 satellite was originally launched in 1984 from the United States, but failed to achieve its correct orbit. It was then rescued and refurbished.

The Hutchison official said about 60 per cent of the cost of the venture would be spent on the launch and insurance. Purchasing the satellite and its refurbishment would account for the balance.

Negotiations are already underway with telecommunications authorities to hire the necessary services for the project.

In other contexts, C and W and Hutchison are fierce adversaries. Hutchison, together with British Telecom, is competing against Hongkong Telephone, 80 per cent owned by C and W, to provide cable television services in Hongkong, a contract which is likely to be awarded by the autumn.

However, some analysts have been predicting that Hutchison and C and W were likely to move closer together.

C and W could draw on Hutchison's contacts in developing its business in China, while Hutchison could benefit from C and W's experience in building up its telecommunications operations.

Further complicating matters, Mr Li recently acquired a 4.9 per cent stake in C and W for about $3 billion, insisting that the stake was no more than a long-term investment.

Since its establishment by the Hutchison group as a communications subsidiary in 1986, Hutchison Telecom has aggressively expanded its presence in Hongkong with the formation of five subsidiaries.

Access for Taiwan, Other Details

55400036 Hong Kong SOUTH CHINA MORNING POST (Business Post) in English 25 Feb 88 p 1

[Article by Chan Chi-keung]

[Excerpts] Taiwan will have the opportunity to use the domestic communications satellite to be launched from China next year by a consortium of Hongkong, British and Chinese interests.

As Taiwan falls within the coverage area, the island will be able to take advantage of services supplied by the satellite, to be known as Asiasat 1, for both communications and broadcasting.

"They are always welcome to use the service," said Min Yu, president of CITIC Technology Corporation (Cititech), a subsidiary of China International Trust and Investment Corporation Holdings, the consortium's Beijing partner.

So far, only China has clearly indicated it will use the telecommunications services, which could carry telephone, television and data transmissions.

However, discussions have already begun with other countries to lease some of the satellite's 24 transponders, the signal-emitting probes.

Signals could be beamed to remote and border areas of China, such as Lhasa and Urumqi, where communications links by land-based systems would be too costly or physically impossible.

But Hongkong will probably not benefit directly given the land-based communications available in the territory's small area.

Taiwan, on the other hand, has a long geographical stretch from north to south and it would be worthwhile and practical to use domestic satellite communications for the island.

After two years of deliberation, an agreement to launch and operate the Westar 6 satellite, which was retrieved from an incorrect orbit three years ago, was signed in Hongkong yesterday by Cititech, the British telecommunications giant Cable and Wireless, and Li Ka-shing's Hutchison group.

The project will cost about $960 million, including the launch cost of about $280 million and the purchase cost of the satellite for $280 million.

Insurance for the launch makes up the bulk of the balance.

The satellite would normally have a working life of eight years but might function beyond that span, according to Mr Gale.

He added that on top of the in-orbit cost, a control and monitor station costing $20 million to $30 million would be established at Stanley in addition to the other Hongkong stations operated by C&W.

Participating countries would own and operate self-contained domestic satellite networks. Receiving areas will set up antennae which, depending on size, might cost from a few hundred dollars to a million dollars.

Asiasat I will be launched by a Chinese Long March III rocket under the supervision of the China Great Wall Industry Corporation and will be given priority status in China's space program.

The satellite is capable of carrying all types of domestic telecommunications signals including public and private telephone and data communication services, television distribution, very small aperture terminal data operations and telemetry.

Asiasat I has 24 transponders and each probe has the capacity to provide the equivalent of 800 simultaneous telephone conversations or one television channel.

Technical reasons mean the satellite can only provide a maximum of about 12,000 simultaneous telephone calls, 24 television channels or a mix of the two.

Existing telecommunications facilities between Hongkong and Guangzhou can handle approximately 3,000 simultaneous telephone conversations.

Mr Gale said the satellite would be strictly for domestic use with no international application.

International telecommunications are currently provided by Intelsat, a consortium of national bodies.

07310

New TV-Policy Rules Bar Foreign Ownership

5540004 1a Hong Kong HONGKONG STANDARD in English 16 Mar 88 pp 1, 2

[Article by Fiona MacMahon, Winnie Fu and Chito Santiago]

[Text] Foreigners have been banned from controlling Hongkong's television stations under new policies unveiled yesterday.

The new rules also prohibit television stations from running unrelated businesses.

The new rules will take effect in December when new 12-year television licences are granted.

As a direct result of the announcement, trading in shares of TVB and its major shareholder Bond Corporation International Limited, owned by Australian tycoon Alan Bond, have been suspended for today to take stock of the new regulations.

Both companies refused to comment in detail yesterday, saying that they needed time to assess the changes.

The announcement is in line with suggestions made by the independent Broadcasting Review Board in August 1985.

It ended speculation about the future of the television industry and the possible extent of foreign ownership of the powerful electronic media.

Chairman of the now-dissolved board, Mr Justice Noel Power said: "As a whole, the new regulations appear to be quite sound and figures on how much people can own are to some extent arbitrary."

The new rules cut down foreign ownership from 75 to 49 percent as a whole, with individual ownership fixed at a maximum of 10 percent.

Any foreign ownership of more than two percent has to be approved by the Broadcasting Authority.

Boards of television stations will also have to comprise a majority of locals—permanent residents ordinarily living in Hongkong.

However, BCIL will be able to apply to the Broadcasting Authority to retain its existing TVB holdings as they were bought before the Government made it known that it was going to deal with the issue.

Mr Justice Power said this "escape" clause was fairly normal.

"Retrospective legislation is very rarely introduced. That would be a draconian measure enforced on someone who acted within their rights and in good faith," he said.

The new regulations will also scrap any control and ownership by a holding company.

This means that TVB, Hongkong's largest television station, will not qualify for a new licence if it keeps its existing structure.

At the moment TVB operates under the holding company Television Broadcasts Ltd.

TVB have more than 20 subsidiary companies under their holding company involving, among other businesses, publishing, printing, entertainment and foreign tour operations.

The holding of subsidiary companies was a particular issue that the BRB challenged in its report. It ruled that the holding of subsidiaries was not in keeping with the spirit of the Television Ordinance.

Under existing legislation, the Government has no control over the holding company, which enables it to bypass all legislation governing the licensee company.

Announcing the new regulations the Secretary for Administrative Services and Information, Mr Peter Tsao, said: "There are 12 different sections of the ordinance that can be, and indeed many are, bypassed by the creation of another company on top of the licensee company.

"The rules become totally ineffective, because the licence belongs to one company, and the control is vested in the holding company, over which we have no power at all.

"That is not in line with the current policy or the spirit of the legislation. I don't think that that is a situation we can contemplate after the issue of the new licences," he said.

Existing rules forbid a licensee company to operate business other than broadcasting, allow no nominee shareholders and require a licensee company to report regularly on its earnings and shareholding informations.

Mr Tsao said the television stations would have to find a way to comply with the new requirements.

"At the moment all I can say is that the relationship between both TV stations and their holding companies is not one which will be allowed under the new licences," he said.

"In this particular case, we are dealing with a monopoly."

Under the new conditions, a licensee company may not hold directly or indirectly any subsidiary company unless they are "connected or associated" with television broadcasting and approved by the Broadcasting Authority.

Mr Tsao said the main reason for imposing stricter regulations on foreign investment in broadcasting was to keep control of the local TV media in local hands.

Managing Director of BCIL which holds 26.7 percent of TVB, Mr Peter Lucas, said that action to be taken was being considered and would be communicated to share holders as soon as practicable.

"The company will determine as a matter of priority the implications for BCIL's shareholding in TVB," he said.

ATV's chairman, Mr Deacon Chui, was unperturbed by the changes stating that he had been expecting them for some time.

The measures were fair and in the public interest, he said.

He did not think the new restrictions would discourage foreign investment.

Mr Justice Power said foreign ownership was controlled in other countries.

He defended the referrals to the Broadcasting Authority on questions that could be open to interpretation.

"That's what we suggested. You couldn't have a better body to refer back to on open issues.

"They are independent and have no vested interest in the TV stations. They are an impartial body concerned with the interests of the community."

Market observers said Alan Bond might shed his holdings in HK-TVB or might spin-off his TV interests into a separate company as a result of the new regulations.

They said it might not be attractive for Mr Bond to hold that stake anymore because his holding company was highly-geared.

"Obviously, that will seem to be putting him in a position where he probably has to raise cash or consider selling his stake," one broker said.

Mr Bond has said that the TVB shareholding was an excellent strategic long-term investment, which the group fully intended to maintain.

/9274

Broadcasting Authority To Gain Control Over Radio

55400041b Hong Kong SUNDAY MORNING POST in English 20 Mar 88 pp 1, 2

[Article by Sa Ni Harte]

[Text] The Broadcasting Authority is expected to have its power expanded to cover radio broadcasting by the end of the year.

The move by the Government will allow the authority to decide whether Hongkong should licence more commercial radio stations by taking up available spare frequencies.

A senior Government official told the SUNDAY MORNING POST yesterday that the authority is also expected to consider whether the British Forces Broadcasting Services (BFBS) would be permitted to continue to use the territory's existing frequency.

The service is part of the radio division of the Services Sound and Vision Corporation, a worldwide organisation providing entertainment, information and training film, video, television and radio services for the British Forces, under contract to the Ministry of Defence.

At present, it also provides two radio services designed for the particular needs of the Gurkha and British Forces serving in Hongkong, Brunei and Nepal.

The decision to broaden the responsibility of the Broadcasting Authority will make it the sole body formulation policy for public broadcasting.

The authority's chairman, Mr Allen Lee, said yesterday he expected the organisation's responsibilities would move to cover radio broadcasting after it completed its work on television.

He said the Government had not objected to the idea of the authority handling the radio broadcasting industry.

"Actually, it should be in the ambit of the whole broadcasting field," Mr Lee said.

"I don't see any problem (in its implementation) as long as we finish our urgent agenda items (cable television and wireless television). Then we will get into radio right away," he said.

Mr Lee said that when he was approached by the Government to be chairman of the authority, he advised the administration that it should first cover complex issues such as cable television, renewal of the licensing conditions of the two television stations and plug all loopholes that "we got 15 years ago after the first licence on television was issued."

According to official sources, the authority would also look into all aspects of licensing more commercial radio stations.

Its terms of reference would include:

- Whether there is a demand for a third radio station.
- The financial implications for existing stations over the scramble for advertising.
- Whether an extra radio station would provide listeners with more choice.
- Whether more stations would lower the quality of programs.

Mr Lee said he would be drafting recommendations to be submitted to the Government soon so that radio broadcasting would come under the authority's umbrella.

Although radio broadcasting is at present outside the scope of the authority, Mr Lee said he had received representations from Commercial Radio but he declined to disclose its content.

"I haven't looked into that yet as far as the authority is concerned. It is only for my information. All I can say is that they did express concern on the subject (of radio broadcasting)," he said.

Commenting on the Executive Council's decision last week to approve restrictions on foreign ownership of local television Mr Lee said this did not mean that the Bond Corporation International Limited's stake in TVB would have to be cut.

Under the new guidelines, foreign companies with interests in local television stations as at November 24, 1987, may apply to retain their holding.

Mr Lee said the Bond Corporation would probably be allowed to retain nearly all its 30 per cent share holding in TVB.

He said: "What we want to do in this case is ask Bond Corporation to apply to the Broadcasting Authority for approval of their holdings. But the holdings should not be at the current level.

"My current understanding is that the company held 26.77 per cent at the time the announcement of the review was made last November.

"So I think it is fair to hold November 24 as the cut-off date."

/9274

Protection of Computer-File Confidentiality Addressed

Government Guidelines

55400040b Hong Kong SOUTH CHINA MORNING POST in English 17 Mar 88 p 3

[Article by Simon Macklin]

[Text] Banks and credit-card companies will be urged to protect computer files containing confidential information about their customers, in special guidelines to be issued by the Hongkong Government today.

Although the new instructions are not legally binding, the administration will recommend that firms operating major computer data banks comply until follow-up laws can be framed.

The guidelines, published in a booklet entitled DATA PROTECTION PRINCIPLES AND GUIDELINES, say the Government will eventually enforce the data protection directives in order to maintain Hongkong's reputation as an international financial centre.

Several European countries and Britain recently signed an agreement forbidding the transfer of electronic data to territories which have no regulations restricting access to personal data stored in computers.

The Secretary for Administrative Services and Information, Mr Peter Tsao Kwang-yung, will send a personal letter to more than 2,000 major computer users asking them to abide by the regulations until they can be backed with legislation.

Large computer users have indicated that they are anxious for regulations to be put in place to maintain the integrity of companies using large data banks.

In some cases, a single computer system may contain personal information on millions of people.

The Government will make the booklet available to doctors, insurance companies and other institutions which collect and store personal information on people.

The guidelines say that companies operating large computerised record systems should use special passwords to restrict access to their data banks and ensure that there is a high level of physical security.

As far as possible, personal data should be gathered directly from the subject to ensure accuracy and to limit the possibility of bias.

And the information gathered should be restricted to the minimum amount necessary, with access limited to a "need to know" basis.

Companies will be asked to review their computer data banks on a regular basis and destroy all out-of-date or redundant personal data.

Personal data should not be disclosed for purposes other than those which have been specified, except with the consent of the data subject.

The Government itself has compiled personal details on most, if not all, of the territory's citizens, stored on computers in various departments, including the Immigration Department, the Inland Revenue Department and the Medical and Health Department.

Senior officials have long been aware of the danger that some of this information could be exploited if it falls into the wrong hands.

Key Government departments were given instructions on securing data banks as long ago as 1985.

But the guidelines to be released today illustrate the determination of the administration to extend this protection to the private sector.

Government officials say they expect laws to be introduced in the next two years.

The ability of computers to store vast amounts of personal information, which can be processed and transferred at high speed, has highlighted the dangers to privacy computers can pose.

By accessing information from medical records, along with financial and mortgage agreements, it would be possible to build up a complete picture of an individual's private life.

The Government is anxious to ensure the integrity of the large computer users so that the public can feel secure in trusting them with personal information.

International Controls

55400040b Hong Kong SOUTH CHINA MORNING POST in English 23 Mar 88 p 2

[Text] Hongkong may be forced to abide by strict international regulations governing personal data on computers.

The Secretary of Administrative Services and Information, Mr Peter Tsao, warned yesterday that failure to conform with worldwide laws designed to protect individual privacy could jeopardise the territory's business and commercial stature.

In laissez-faire Hongkong, the Government was typically wary of legislating and had adopted a cautious approach to the issue, Mr Tsao said.

However, Mr Tsao said: "If there should be any indication that legislation is needed...then we will introduce it."

"What we don't want to see is Hongkong being denied computer data. That would be disastrous.

"Hongkong, as a financial and commercial centre, must have a free flow of such data and we would do everything to make sure that it remains in that position."

Voluntary guidelines on the protection of data have already been distributed to major computer-users such as banks and insurance companies. The Government has also accepted, although only in principle, that legislation should ultimately be introduced.

But Mr Tsao yesterday reassured businessmen at the Kowloon East Rotary Club that Hongkong's general non-interventionist philosophy would be maintained as far as possible.

"The experience of other countries in implementing data protection legislation has not always been a happy one.

"It is of paramount importance to strike the best possible balance between the interests of those who use personal information in their everyday business and those who are the subject of that information."

As a subscriber, through the United Kingdom, to the International Convenant on Civil and Political Rights, Hongkong was obliged to ensure no one was subjected to arbitrary or unlawful interference of their privacy, said Mr Tsao.

Remedies against such invasions of privacy as breach of copyright, negligence and defamation were already covered by Hongkong law, however, existing laws did not provide a comprehensive means of protecting the privacy of personal data, Mr Tsao said.

Most significantly, Hongkong could be denied a free flow of personal data from abroad if privacy of personal data was not legally guaranteed.

The Government is already attempting to promote sound data protection practices without wielding any big stick through its booklet Data Protection Principles and Guidelines, Mr Tsao said.

Over the next year, a working group will also examine legislation abroad with a view to assessing what might best suit Hongkong.

/9274

BULGARIA

Bulgaria Hosts Conference on Telecommunications

55003002 Sofia RABOTNICHESKO DELO in Bulgarian 17 Mar 88 p 2

[Article by Ekaterina Popova: "International Scientific Seminar: In the Era of 'Service-Oriented' Technology"]

[Text]

Specialists From 10 European Countries Will Discuss Models of Current Communications Systems

A theory of telecommunications and computer modeling: this is the theme of an international seminar, which will be held in Sofia from 21-26 March 1988 at the House of Scientific Workers of the Bulgarian Academy of Scientists (BAN). Specialists from 10 European countries plan to attend.

This forum, which is the first on this topic to be held in our country, has been organized by the Mathematics Institute at the BAN, jointly with the Information Transmission Problems Institute at the USSR's Academy of Sciences, and with the cooperation of the Communications Association, the Elektronika Association, and the Economic Trust for Information and Communications Systems. It will be held under the auspices of the International Consultative Council of the International Congresses for Telecommunications, whose President Professor Dr. Arne Jensen will be among the scientists attending the meeting. Famous scientists, such as Soviet Academician Boris Gnedenko, Professor Paolo Defera from Italy, and Geza Gostini from Hungary, will also participate in the seminar.

Deputy Chairman of the national organizational committee Professor Petur Todorov explained that specialists will discuss current methods in the theory of communications systems and the introduction into practice of digital communications systems with integrated functions. These systems enable the subscriber to access via a terminal different types of services, such as bibliographic references, purchasing, and making reservations.

INTER-AMERICAN

Andean Satellite Control Center Planned

55002004 Caracas EL NACIONAL in Spanish 27 Mar 88 p A/1

[Text] Venezuela will be the host country for the headquarters and space control center of the Andean Satellite Telecommunications System known as "Project Condor" which will be developed by Bolivia, Colombia, Ecuador, Peru, and Venezuela at a cost of U.S. 210 million dollars.

Dr. Miguel Angel Meneses, president of CANTV, said the decision was made after two days of meetings by the presidents of state firms in the Andean Sub-regional Accord, held in Caracas on 24-25 March 1988. This project will cover national and intra-regional telephone, telex, data, and television needs.

Barbados Official Reviews New Caribbean Satellite TV

55400042 Bridgetown BARBADOS ADVOCATE in English 24 Mar 88 p 1

[Text] The Barbados Government yesterday formally welcomed an expanded regional television news exchange project, but cautioned against accepting mediocre standards in the move towards reducing the high level of foreign programming.

"The Caribbean region, with millions of persons of every ethnic and religious composition, can no longer be content with television programming which contains up to 90 per cent of imported material," Deputy Prime Minister Philip Greaves said.

He was addressing the formal launching of Caribvision—a beefed-up TV news exchange project linking Jamaica, Trinidad and Tobago and Barbados by satellite five days a week. The scheme is operated by the Barbados-based Caribbean Broadcasting Union (CBU).

Said Mr. Greaves, who is also responsible for telecommunications: "Our dancers, our dramatists and writers have for sometime now been signalling to regional Governments and peoples that we in the region are running the risk of losing our cultural identity and that we need to promote regional unity and integration."

Cultural Links

Scarce financial and human resources, he said, placed limitations on efforts to develop and strengthen cultural links in the region, but called for serious efforts, especially by regional programmers to "counter the invasion" of foreign-produced material in the region.

Mr. Greaves however stressed that badly produced local programmes was not an effective answer to the "almost total blackout of local programmes."

"I do not believe it is beyond our capability to produce good quality programmes. We therefore ought not to put up with mediocrity merely because it is ours and entertaining," the Barbados minister told the opening ceremony, attended by top executives from regional television stations and telecommunications companies.

Catastrophes

Mr. Greaves said he was confident that if a consistently high standard of local and regional news as well as cultural presentations was maintained on a regular basis, it would receive the support of the general public.

He said cultural identity could be endangered when cultural models reflecting alien life-styles and values predominate.

"We have been fed constantly a diet of 'hot' news, political upheavals, coups and catastrophes. We have been accustomed to little on show by way of developmental activity which could depict developing countries in a favourable light," Greaves said.

"We are better informed about what is going on in Palestine or at Coca-Cola," he remarked.

"...Our countries are bombarded by high-powered advertising material which distorts the values of our people, thereby putting undue pressure on Governments to provide the goods and services they see on display, and that are not compatible with the life we know," Mr. Greaves said.

Small Societies

He however warned that in the hysteria of dealing with cultural penetration, the region could be in danger of "spinning a cocoon around our very small societies".

"We ought not, I submit, close the door against other influences," he said.

Consultant from the German-based Frederich Ebert foundation, Michael Abend who laid the groundwork for the news exchange project, said the CBU would launch a weekly news magazine—Caribscope—on April 13.

Mr. Abend announced that the FES had agreed to extend financial support to the project for no less than two years, with funding exceeding US$200,000 annually.

He said the news exchange, a low-cost project, had become a reality in a short space of time—five months—because there were people in the Caribbean "with dedication and commitment, ideas and enthusiasm."

Abend said 16 countries were now interested in the television news exchange.

"Within a very short time the news exchange has become a factor of integration for the Caribbean, the political and cultural importance of which cannot be overestimated," he said.

West German Ambassador to Trinidad and Tobago Joachim Richard Vogel has pledged his government's continual support for the "Carib Scope" and "Caribvision" programmes of the Caribbean Broadcasting Union.

The Ambassador was addressing participants at the launching of Caribscope yesterday at the Wildey Conference. Caribscope represents the latest in a series of efforts by the CBU to foster regional integration.

Apart from new and current affairs, the new magazine will highlight cultural and other human interest aspects of Caribbean life.

According to the Ambassador it is about time that the region increase the flow of information on the region, and save its people from the influx of foreign material.

Financial assistance to the CBU will be provided by way of one of the four Foundations in Germany funded by the German Federal Government, rather than by direct government to government assistance.

/09599

BELIZE

British Telecom Buys Shares in Local Operation

55400043 Belize City Domestic Service in English 0100 GMT 9 Apr 88

[Text] The Government of Belize on Friday, April 8, sold to the internationally-known company British Telecommunications, BLT [as heard], 8 million B ordinary shares in Belize Telecommunications Limited for a price of 16 million Belize dollars.

An offer of sale was opened to the general public on March 24th, 1988 by Belize Telecommunications Limited [BTL].

The Government of Belize is offering to the public 24 percent of the shares in BTL. This represents 7,680,000 shares. The price of the equal share is $2 and they (?sell) a form and applications at the project.

The offer for sale states that BTL will be paying a yearly dividend of 15 percent on its ordinary shares and 11 percent on the redeemable preference share. British Telecommunications, BLT, will try to [words indistinct] in the Belize Telecommunications Limited, along with the Belizean public who has also been invited to (?buy) shares.

It should be noted that British Telecom is the largest telecommunications company in the British Commonwealth and will bring to Belize its considerable expertise in this field.

/09599

ST LUCIA

First Digital Earth Station To Be Opened Here

55400037 Castries THE WEEKEND VOICE in English 27 Feb 88 p 17

[Text] Another major development in Cable & Wireless (W.I.) Ltd.'s operations in St. Lucia will take place in June when the company opens the first digital earth station here.

The event will coincide with Cable and Wireless' 50th anniversary. The new earth station, the only one of its kind in the entire Eastern Caribbean, will provide direct telephone links to the United States, Britain and Canada, an international gateway for telephone traffic for St. Vincent, Grenada, Dominica and Antigua, international TV transmission and reception of important events and an initial capacity for 120 voice circuits, and data transmission at speeds of up to two megabits per second.

A company spokesman explained that the last capability will make St. Lucia especially attractive as an offshore data entry location, thus enabling the company to make a direct contribution to job creation in the country over and above the employment of its own labour force.

C&W introduced automatic telephone service to St. Lucia in 1966, replacing the government—owned manual system. Since then, the Company has progressively automated and upgraded both the national and international dialing services.

In 1977, a 960 channel microwave system linking all the islands from Tortola in the north to Trinidad in the south was installed. In 1982, the first digital telephone system in the OECS was installed in St. Lucia, providing direct dialing of overseas calls for the first time. By the end of 1988, St. Lucia will join Dominica, Anguilla and St. Kitts as the only totally digital telephone systems worldwide.

/9738

INDIA

Pakistan Reported To Jam Poonch Transmitter

55500105 Calcutta THE TELEGRAPH in English 26 Mar 88 p 5

[Text] New Delhi, March 25 (PTI, UNI)—Pakistan has commissioned a TV transmitter in occupied Kashmir which is adversely affecting the reception of Doordarshan's Poonch transmitter, the information and broadcasting minister, Mr H.K.L. Bhagat told the Rajya Sabha today. He said the matter had been taken up with the Pakistan authorities after a team of engineers, deputed by Doordarshan to conduct a preliminary investigation, observed that the Pakistan transmitter was operating on the same channel as the Poonch transmitter.

/06662

Details of Launching of Remote Sensing Satellite

Launched From USSR

55500101 Calcutta THE TELEGRAPH in English 18 Mar 88 p 1

[Text] Baikonour, March 17 (PTI, UNI)—The Indian satellite IRS-1A went into orbit today, making India the fifth nation and the first developing country to have its own operational remote sensing satellite in space. The other four nations are the United States, Soviet Union, France and Japan.

The Rs 650-million, 975 kg snow-covered satellite was shot into space after a magnificent launch by the Soviet Vostok rocket from the cosmodrome here at 12 hours 13 minutes and 30 seconds (IST).

Authorities said the spacecraft was circling earth over the poles at a height of 904 km, taking 103 minutes for each orbit.

The preliminary post-launch manoeuvres for deploying IRS-1A in the sun acquisition mode were successfully completed today, according to the Indian Space Research Organisation (Isro).

All the ground stations were tracking the spacecraft which was being controlled from a specially set up mission centre at Peenya near Bangalore. All the ground tracking stations at Sriharikota, Lucknow, Trivandrum and Mauritius along with those at Bearslake, Malindi, Weilheim and Fairbanks had begun tracking the satellite.

The earth station of the National Remote Sensing Agency at Shadnagar, about 50 km from Hyderabad here, received telemetry data from IRS-1A soon after its launch.

The NRSA director, Dr B.L. Deekshitulu, said the data was received for six minutes from 12.25 pm.

The launch was witnessed among others by Dr U.R. Rao, space commission chairman, Dr K. Kasturi Rangan, project director of the Indian Satellite Centre where the satellite was built and the Indian ambassador in Moscow, Mr T.N. Kaul.

For the Soviet Union, the launch was the first since its space business went commercial. India will pay 7.5 crores for the launch. To mark the occasion, a newly-constructed hotel at Baikonour was temporarily named "India."

IRS-1A carries three linear-imaging self-scanning cameras that will take pictures of 148 km wide scenes in four different colours with a spatial resolution of 38 and 76 metres, officials said.

The data will be received at NRSA originally set up in 1979 to receivepictures from the US satellite Landsat. It was modified last year for receiving data from the French satellite Spot.

Spot pictures can show objects the size of a living room and reveal terrain features in three dimensions. IRS-1A cannot resolve two objects unless they are larger than the size of two tennis courts.

But future Indian satellites are expected to carry high-resolution cameras with a "microwave eye" that can see through clouds. By 1995, Isro hopes that India can totally depend on its own system.

A library a day: The IRS-1A will pass over India seven to eight times a day with each pass having a duration of five to 10 minutes. The data sent down will be equivalent to some 4,000 volumes of 300 pages each—roughly a good sized library of about 10,000 books every day.

The satellite looks like a mythical albatross, its 11-metre solar panels resembling huge wings that keep it afloat.

The three self-scanning cameras operate in four spectral bands covering .45 to .86 microns, that is, in the visible and near infrared region. The main bus of the solar arrays generating a total power of 709 Watts and has data-handling systems transmitting information to ground stations in the S and X bands.

22-day Cycle

The IRS-1A is designed to operate for minimum two years and being sun-synchronous will fly over the same point of earth at the same local time once in 22 days.

It will be used to generate resource information in vital areas of national development like agriculture, forestry, geology and hydrology.

PM Hails Launch

The Prime Minister, Mr Rajiv Gandhi, hailed the successful launching of the IRS-1A as a "major milestone" in India's remote-sensing programme. In identical statements in both Houses of Parliament, Mr Gandhi said India was now the fifth nation in the world to have accomplished remote sensing of the earth's resources from space.

Other Countries To Benefit

55500101 Bombay THE TIMES OF INDIA in English 19 Mar 88 p 3

[Article by L.K. Sharma]

[Text] New Delhi, March 18—Other developing countries will also benefit from India's first operational remote-sensing satellite, IRS-1A, which will be positioned properly in about a month.

The data from IRS will be available at affordable costs and India is ready to supply a low-cost digital analysis system which has been developed indigenously. Over the past few years, the Indian Space Research Organisation has built up considerable expertise in the area of data analysis and its use for management of natural resources.

The designing and fabrication of the operational remote-sensing satellite is no doubt an achievement, but in the case of an application satellite, ultimately it is the use of this hardware that really matters.

IRS will now form the key element in India's ambitious national natural resources management system. It has a mission life of three years and India plans to launch operational remote-sensing satellites at intervals of about two and a half years.

Besides building the satellite, the ISRO undertook a large number of projects developing data analysis capabilities and demonstrating the applications of space-based remote-sensing techniques in various disciplines.

The IRS, which has been delayed by more than two years because of the problems involved in mastering a new technology, has certainly not caught the user agencies napping. They are ready with adequate infrastructure and expertise. They have been using data products from other satellites such as the U.S. Landsat and the French Spot. The data from these satellites is directly received by Indian earth stations run by the National Remote-Sensing Agency in Hyderabad.

Several national and state agencies working in areas ranging from agriculture to urban land use and oil to forestry have done considerable preliminary studies for the utilisation of the IRS data.

Several national and state agencies, R and D organisations, technology mission authorities, regional remote-sensing centres and academic institutions are involved in remote-sensing information generation, data processing, diagnostic analyses and formulation of action plans for better management of natural resources.

As part of the elaborate IRS utilisation programme, the National Remote-Sensing Agency has been executing projects in collaboration with users on the basis of available satellite imagery. It has covered areas of flood mapping, groundwater targetting, geological mapping, soil mapping, drought monitoring, land degradation studies and snow mapping.

The potential benefits have phenomenal implications for the nation's economy. If the presence of blight on the wheat crop in a certain area is detected early through remote-sensing, corrective action can be taken to save the crop. The combination of smart sensors and high-speed data processing has provided a tool which can held [as printed] detect crops under insect stress even before the farmer on the field becomes aware of it.

Work has been done by different agencies on 20 projects, some of which are of an experimental nature. Crop forecasting and water quality monitoring are two experimental projects, so is the project on forest mapping and damage detection.

Results of a crop yield modelling project indicate high correlation between spectral indices and crop growth variables. Vegetation indices derived from visible and infra-red spectral responses are found to have good association with several crop yield parameters. This gives hope that in the near future, the planning commission and the government will have some reliable crop estimates.

08309

Papers Give Details on Satellite Performance, Plans

IRS-1A Performs Successfully

55500103 Madras THE HINDU in English 21 Mar 88 p 6

[Article from our science correspondent]

[Text] New Delhi, 20 Mar—The first of the three Linear Imaging and Self Scanning cameras (LISS-I) on board the spacecraft Indian Remote Sensing Satellite (IRS-1A) has been sending information successfully and has been received by the data reception station of the National Remote Sensing Agency (NRSA), Hyderabad, and preliminary real-time processing and quick-look of the data has revealed that the payload is performing to specifications.

The three cameras that the IRS-1A carries are designated as LISS-I, LISS-IIA and LISS-IIB systems. The cameras use charge coupled devices (CCDs) as detectors and operate in four spectral banks which are in the 0.45-0.86 micrometre wavelength range of the visible region of the electromagnetic spectrum. The CCD detectors are linear arrays consisting of 2048 elements and scan the earth in a 'push broom mode'—the camera sweeps across the footprint or the swath of the spacecraft on the ground during its orbit whose width is 148 km for LISS-I and 146.5 km for LISS-IIA&B combined.

Camera Switched On

The LISS-I has a resolution of 72 metres while the other two have a 36m resolution. The increased resolution is achieved by each of the LISS-IIs covering a swath of 74 km in an overlapping fashion so that the combined image seen is nearly the same as that by LISS-I. The routine imaging mission will be carried out during day time passes which occur with equatorial crossing at 10.25 hrs every day. In Friday's operation only one of the four wavelength windows available to the camera was switched on. Switching on of the other three apparently involves no more complexity and will be done eventually.

The switching on of the camera is one more of the crucial operations in the spacecraft which was being anxiously awaited by the Indian space scientists. This along with the faultless deployment of the solar panel and attaining of the three-axis stabilisation of the spacecraft on Thursday, in effect, means that the satellite's remote sensing operations are ensured. On Thursday night the telemetry command (uplink signals) on S-band (2.2 gigahertz) was achieved and execution of earth acquisition manoeuvres were completed. Similarly reception of data (downlink signals) on both S-band and X-band (8.3 gigahertz) was established on Friday after the switching on of the camera. The data is received at the rate of 5.2 million bits/sec.

Indigenously Designed Subsystems

Behind the successful deployment of the various systems on the IRS-1A are some of the most sophisticated subsystems of the space craft that have been indigenously designed by space scientists. The foremost probably is the so-called 'reaction wheel or the momentum wheel,' that rotates at very high speed to provide some kind of stiffness to the spacecraft by the property of inertia. This is meant to ensure long life to the spacecraft and a very high degree of sophistication has gone into both the mechanical engineering and electronic control aspects of its design.

Though the solar array deployment itself was a crucial element this has caused problems to many satellites including the latest West German communications satellite—the high-tech part actually resides in the solar array drive which ensures that the panel is rotated appropriately to face the sun all the time and energy is transferred to the main satellite. This automatic tracking of the sun actually comes into play after the stabilisation of the spacecraft along the three axes—pitch, roll and yaw—is established up to stringently controlled accuracies. This stringency is essential for ensuring that the images are without smear and distortion. Just before the camera-payload is switched on the sun tracking of the solar panels is momentarily inhibited and the three axes are controlled so that jitter in the spacecraft is almost zero.

High-Tech Control Systems

The three axes stabilisation involves high-tech control systems the most important of them being the 'dry-tuned gyro,' an inertial sensor that senses the rate of change in the direction and corrects the course. Though in principle this gyro is sufficient to control the stabilisation along all the axes additional control support is provided by a 'reaction control system' which consists of microthrusters for minute corrections, a mechanically moving 'conical sensor' that senses the profile of the carbon dioxide around the earth and 'secures the earth' as it is termed. There is also a static earth sensor in addition to the above.

According to the ISRO officials stationed in Delhi the next operation will involve orbit correction manoeuvres prior to the switching of the LISS-II system. This is slated for 29 March. The first set of processed pictures in photoproduct form are likely to be available in a week's time from the NRSA. Data will begin to be made available to the various user agencies in a month's time after all parameters in the satellite's orbit are repeatedly gone over and checked and the IRS-1A's performance is ensured to be completely satisfactory. The satellite will then become fully operational for remote-sensing of the country's resources.

Pictures Equal to Best

55500103 Madras THE HINDU in English
22 Mar 88 p 11

[Article from our science correspondent]

[Text] New Delhi, 21 Mar—"There is no technology to replace space technology on the management and monitoring of our resources," said Dr U.R. Rao, Chairman, Space Commission, and Secretary, Department of Space (DoS), here today.

Talking to presspersons on his return from the Soviet Union after the successful launching of the Indian Remote Sensing Satellite (IRS-1A), he said: "This has been a great challenge for the Indian scientists and we hope to have more such challenges."

Emphasising the need to ensure permanent remote sensing services for the country's development programme, he said that this demand guaranteed access to a remote

sensing satellite which neither the Landsat (of U.S.) or the Spot (of France) could assure. "An indigenous remote sensing satellite becomes imperative not only from a self-reliance point of view, but also from necessity."

Prof Rao called the 17 March IRS-1A launching a milestone in the Indian Space Research Organisation's programme. "We hope to call it operational within a month or a month and a half."

"The first picture which we have got is as good as the best you can get from any of the currently accessible satellites," he said. The first picture, obtained in the 14th orbit of the IRS-1A when it passed over Allahabad, Sriharikota and Rameswaram was of parts of Andhra Pradesh.

"One picture is equivalent to few million words of information and the quality of the picture really showed that techniques of interpretation of raw data and processing developed by our scientists were good. If we continue to get pictures like this, it would be excellent," he said.

He congratulated the entire team of nearly 1,500 scientists from the various DoS institutions responsible for the success of the first in the series of operational Indian remote sensing satellites.

Prof Rao said that the IRS-1A cost about Rs 20 crores and IRS-1B, expected to go up after about 2 1/2 years or so about Rs 25 crores. After 1B, he said, the satellite would be equipped for higher resolution. Asked about the possible launch date for the ASLV, he said the DoS hopes to be ready for it by May end.

Col N. Pant, Director, Indian Space Applications Centre (ISAC), Bangalore, a key figure in the satellite's fabrication was present. Though the other notable figure, Dr K. Kasturirangan, was expected to join the party today, he could not make it.

Microwave Sensing Satellite

UNI reports that India expects to launch its microwave remote sensing satellite by 1993-94, preliminary work on which had started. Scientists were hopeful of achieving the target, Dr Rao said. Efforts were on to minimise the expenditure, and negotiations were on for joint launch facilities so that expenditure could be cut.

Asked if the IRS-1A had any defence applications or purposes, Prof Rao said the Defence Ministry was not involved in any way in the project, which was not defence-sensitive.

The data collected would be useful in formulating an integrated plan to tackle recurring drought. Four districts—Kolar (Karnataka), Palghat (Kerala), Bhavnagar (Gujarat) and Lalitpur (U.P.)—had been selected for preparing models.

Rao on Uses

55500103 Calcutta THE TELEGRAPH in English 22 Mar 88 p 5

[Text] New Delhi, 21 Mar (UNI, PTI): India expects to launch its own microwave remote sensing satellite by 1993-94, the Space Commission chairman, Prof U.R. Rao, said today.

Preliminary work for this had already started and scientists were hopeful of achieving the target, he told newsmen here. Efforts were on to minimise the expenditure, and negotiations are underway for joint launch facilities to curtail expenditure, he added.

Prof Rao, who has just returned from the Soviet Union after the successful launch of the IRS-1A satellite, said the satellite was working according to schedule and would be operational from 15 April. The first set of four cameras had been switched on and the photographs taken were of excellent quality. The other two sets of cameras would be switched on within 5 or 6 days, he added.

Asked whether the IRS-1A had any defence applications or purposes, Prof Rao said the Defence Ministry was not involved in any way in the project. The resolution of the cameras was 30 metres and this was internationally accepted, he said. Several industries were involved in the project but it was not defence sensitive, he said.

The data collected would be useful in formulating an integrated plan to tackle recurring drought, he said. Four districts had been selected for pilot projects. These are Kolar in Karnataka, Palghat in Kerala, Bhavnagar in Gujarat and Lalitpur in Uttar Pradesh.

He said this state-of-art satellite was totally indigenous except for some electronic components. About 1,500 scientists and supporting staff worked for nearly 5 years to make it a success. The aim was to make this a continuous series, he revealed.

Prof Rao said the cost of the satellite was around Rs 20 crore. The remaining satellites in the series would cost about Rs 25 crore each, besides launching expenses.

Asked whether many countries would share the data collected by the satellite, he said this could be decided only after the satellite became fully operational. He disclosed that the augmented satellite launching vehicle (ASLV) would be ready by the end of May this year.

He released the first picture of parts of Andhra Pradesh taken from the satellite. The picture, which he described as the "best you can get from space," was taken the day after launch on the 14th orbit as IRS-1A passed over Allahabad to Rameswaram.

He said the operation and maintenance of the IRS system would annually cost India about Rs 200 to 300 million. India will continue to receive data from the American Landsat and French satellite, Spot.

Drought Control Planned

55500103 Calcutta THE TELEGRAPH in English 28 Mar 88 p 5

[Text] Bangalore, 27 Mar (UNI)—The Indian remote sensing satellite, IRS-1A, now awaiting operationalisation after its 10-day sojourn in space, will herald an era of new technology in drought management in the country.

The prestigious satellite is expected to be fully operational by the middle of April. Space scientists have already switched on one of the three cameras aboard the spacecraft and it was beamed back to Earth quality pictures in its trial sweep over the country. The two other cameras are slated to be activated after completion of fine orbit trimming manoeuvres.

When in full operation, drought management will be one of the major areas where the satellite would be of great help when combined with data available through conventional methods. An Indian Space Research Organisation (ISRO) spokesman told UNI that the satellite would help in standardising the methodology already tried out for groundwater targetting, utilising landsat and spot imageries, as part of the strategy for combating drought.

The spokesman said multidisciplinary studies of the drought problem in 200-odd drought prone districts in the country would be possible with IRS-1A. Four districts had already been selected for such studies. These were Kolar in Karnataka, Bhavnagar in Gujarat, Lalitpur in Uttar Pradesh and Palghat in Kerala, he added.

Space scientists recently undertook a rapid indicative study using foreign satellite imageries in three of these four districts—Kolar, Lalitpur and Bhavnagar—for case study. These districts have been chosen again under the IRS-Utilisation Programme to enable updating of data already collected and provide the much needed continuity in such studies.

These districts had been chosen for study since the average rainfall here does not exceed 1000 mm even under normal conditions. Agriculture has been the mainstay in these areas, and irrigation has been traditionally sustained by water tanks, wells and a few streams.

The study in the three districts began with the generation of cloud free satellite imageries for each of the districts. After transferring these on to a base map, a series of thematic maps were prepared.

One map showed surface water body with dry tanks and reduced water spread, a groundwater map indicated the potential sources for tapping, another map showed the potential sites for artificial recharging and a fourth indicated the extent of soil erosion. Another map showed the existing land distribution including different categories of waste lands. All these maps were used to prepare an integrated land and water sources map as part of a comprehensive drought management plan.

Apart from groundwater targetting, the satellite would also be used for studying crop pattern, forest mapping and a host of other projects in the areas of hydrology, ecology and geology.

The environmental impact of mining and super thermal power station projects, particularly the impact of mining at Kudremukh and Doon valley and the thermal stations at Korba and Talcher, would also be studied.

/9604

India Begins Transmission of Time Through Satellite

55500104 Madras THE HINDU in English 29 Mar 88 p 9

[Text] New Delhi, 28 Mar—India today became the second country in the world after the United States to transmit the standard time through satellite.

The National Physical Laboratory, the timekeeper of the nation, launched the new time dissemination service via the INSAT-IB.

The Communications Secretary, Mr D.K. Sanghal, formally switched on the service which was under experiment since 1977.

Satellite transmission of time will help improve efficiency and accuracy in navigation, telecommunications, Defence, earthquake warning systems and radio and television broadcasting.

The NPL which maintains the standard time on atomic clocks sends coded signals to its ground station in Secunderabad for onward transmission to the satellite. The INSAT-IB then beams the time across the country for various users who get it on direct reception sets. The sets convert the coded signals to display the correct Indian Standard Time.

Satellite dissemination of time started on an experimental basis in 1977. The French-German satellite Symphonie-1 transmitted signals from Delhi to the Space Application Centre at Ahmedabad. Mobile terminal tracking equipment was also used for this purpose.

Two new high frequency transmitters were also switched on today at the Videsh Sanchar Nigam facility here to ensure efficient time service and overcome foreign interference.—UNI

/9604

Plans for Changes in Telecommunications Administration

55500100 Bombay THE TIMES OF INDIA in English 10 Mar 88 p 17

[Article by Bharat Bhushan]

[Text] New Delhi, 9 March—The government is planning to set up a telecommunications commission as the apex policy-making body for developing the telecom network in the country.

Simultaneously, the existing Telecommunications Board would be restructured on the lines of the Railway Board and would thus be upgraded as the executive wing to implement the policies formulated by the commission. Each of its members would be an ex-officio secretary to the government of India.

As in the case of railways, a separate telecommunications budget would be presented to Parliament after the reorganisation comes through. A special feature of the telecommunications commission would be that it would include "prominent" non-officials from telecommunication-related fields such as management production, technical education and economics. It would also have a labour leader from the telecom unions as its member.

The proposal to reorganise the telecommunications department in this manner has been discussed in detail by the committee of secretaries and is likely to go to the Union cabinet for approval later this month.

Alternative Structures

The committee of secretaries apparently discussed various alternative structures for the telecom department, including the possibility of forming a public corporation. However, none of them was found acceptable at this stage as the consensus was in favour of an organisational structure within the government.

Apparently, comparisons with the Railway Board found favour and it was decided to remodel the telecommunications board on the lines of the former. Because it was felt "necessary to involve knowledgeable experts in the field of telecommunication technology, management and others" in policy formulation, a telecom commission was thought of as the apex policy-making body.

Once the telecommunications commission is set up all matters relating to the telecom sector would come under a unified authority with adequate "autonomy and flexibility" for policy formulation. The policies formulated by the commission would not require separate reference to other ministries or departments unless they relate to the provisions of Statutory Regulations.

Thus, all telecommunications plans—whether perspective, five-year or annual—would be formulated by the commission.

Plans and proposals for establishing or expanding the telecom network, outside the networks of the department of telecom (e.g. railways, defence and oil sector would be cleared by the commission to ensure optimisation of limited resources and standardisation.

The chairman of the telecom commission would have the rank of minister of state. The chairman along with non-official members of the commission would function as part-time employees.

There would be three non-official members—two from telecom related fields and the third a prominent labour leader. Together with the chairman and members of the telecommunications board, the commission would also include secretaries to the government, from the planning commission, the ministries of finance, industry, defence, railways, electronics, space and science and technology.

The telecommunications board would function as the executive wing of the ministry. All applications for industrial licences, imports and foreign collaborations, relating to telecom would be referred to the board. Thus, unlike now, the Department of Electronics would have no minitoring role over telecom imports.

A separate annual telecom budget would be prepared by the telecom board. the board would exercise the powers of Central government in administrative matters as well as in all matters of telecom finance, subject to the budget approved by Parliament.

The reorganisation is expected to make the telecom ministry more effective and free it from "normal bureaucratic and needlessly inelastic rules and regulations."

/12913

New Criteria To Assess Telecommunications Progress

55500099 Madras THE HINDU in English
2 Mar 88 p 16

[Text] Telephone accessibility rather than telephone density will hereafter be the yardstick to assess the development of telecommunications. A decision to this effect was taken and announced at the just-concluded Asia Pacific Telecommunications Development Conference here.

Hitherto, the development status in the telecommunications sector used to be assessed on the basis of the number of telephones per hundred population. A strong view was expressed at the conference, attended by telecom experts and administrators from countries in Asia and Pacific, that this criterion would have little relevance in highly populated countries. It was therefore agreed that the new guideline for telecom development, particularly in the developing countries should be 'telephone accessibility.'

Under the new guideline, the telecom development status will be judged not only by the number of individual telephone connections but also by the number of community telephones. The idea is that a community telephone should be available to every citizen within the distance of a five-minute walk. In fact, this is in line with the Arusha Declaration on Worldwide Telecom Development which seeks to bring the whole of mankind within easy reach of a telephone by the early part of the 21st century. The objective of the Technology Mission on Communication in India too is to set up rural exchanges and provide access to telephone to the rural people within the five-minute walking distance by the turn of the century.

Another point stressed at the conference related to telegraph services. In the developed countries telegraph services are gradually being phased out and the conference felt that this should not be allowed to happen in developing countries, where there was need for modernisation of telegraph services.

/12913

Fastest Growth in Telephone Service, Plans Told

55500098 New Delhi PATRIOT in English
21 Mar 88 p 5

[Text] The Mahanagar Telephone Nigam Limited (MTNL) has commissioned a record 70,931 new connections in Delhi alone in its first 19 months of operation, reports UNI.

The Nigam, which made a profit of Rs 136.52 crore and gave the Government a Rs 84 crore dividend in its first year of operation ended 31 March last year, has been responsible for the fastest growth in the Indian telecommunications system.

Official figures show that operational efficiency has also been improving steadily since the public-sector company was set up in February 1986, to take over the telephone and telex networks in Delhi and Bombay.

Continuous upgrading of exchange plants and new training programmes to ensure higher employee commitment at all levels have brought the fault rate down from around 35 per hundred telephones a month as late as September 1986, to 20.6 by 31 October 1987.

The local call success rate has gone up from 89 per cent to 94 per cent, trunk efficiency from 63.9 per cent to 71.5 per cent and the subscribers' trunk dialing (STD) call completion rate from 20 per cent to 60 per cent over the same period.

The improvement has come in for praise from the World Bank in a recent appraisal reported through an aide memoire, as well as by various customers right up to Prime Minister Rajiv Gandhi.

The prompt action taken and announced at the 'open house' and 'telephone adalat' sessions has also been lauded by subscribers and media alike, according to Nigam sources.

The Capital is now connected with 428 cities in India by STD, and 150 countries on the international subscriber dialing (ISD) network, as against just 264 and 11 respectively when MTNL was set up.

More and more of the old rotary dial telephones are being replaced by pushbutton instruments at a one-time charge of Rs 500 to minimise wrong numbers.

The waiting list for new connections has, however, kept pace with the increasing number of lines provided. Nearly 200,000 people are waitlisted at different exchanges in the Capital alone, as against 155,000 in April last year.

This is despite the fact that almost every new exchange project has been completed well before time, while targets for expansion and upgrading of the system have all been met or even crossed in 1986-87.

In the remaining three years of the Seventh Plan period, the Nigam plans to invest Rs 1,633 crore in its twin endeavours to upgrade the quality of telecom services to the international level and expand the network to clear the waiting lists in Delhi and Bombay. More than half this investment will be financed through internal resources.

The development plan for 1987-90, finalised after detailed discussions with the Department of Telecommunications (DOT) about allocation of exchange equipment, transmission system, cables and other materials, envisages the provision of more than 750,000 additional telephone lines and 8,800 telex lines in both the metropolises together.

Another 135,000 old and worn-out telephone lines will also be replaced.

As many as 1,200 km of cable routes will be ducted and 249 km of fibre optic cable laid, while microwave systems will be introduced for 1,078.4 km and 11,319 pulse code modulation (PCM) systems installed.

Two out of every five customers in both Delhi and Bombay will also have push-button telephones.

Detailed billing has been introduced for more than 64,000 customers covered by all the E-10B digital electronic exchanges in 1986-87. MTNL aims at covering its entire area of operation by 31 March 1989 and orders for automatic message accounting systems to be installed in all the electromechanical exchanges are being finalised.

/12913

Telecom Systems Spreading Into Rural Areas

55004708 Calcutta SUNDAY in English
20-26 Mar 88 pp 62-63

[First paragraph is introduction]

[Text] Sam Pitroda has kept his promise. And Indian villages will, from next month, begin to have their own telecom systems.

Six years ago Sam Pitroda promised to change the face of Indian telecommunications. Now, after years of dogged effort, change is coming where it should: in India's small towns and villages.

Starting next month, the government is pushing ahead with an ambitious scheme to install rural automatic exchanges (RAX) designed by Pitroda's Centre for the Development of Telematics (C-DoT) in one town a day. By the end of the year about 400 128 ports RAX systems will be in place if the programme goes according to schedule. And the department soon hopes to produce anywhere around 1,000 systems every year.

In a small Karnataka town—Kittur, in Belgaum district—the RAX is already showing its paces and how it can revolutionise telecommunications in rural India. In the last few months since the RAX began operations, the change has been nothing less than startling. It is now possible to call anywhere in India, or for that matter the world, by subscriber trunk dialling. In less than two months the demand for phones in Kittur has doubled. The change has had impact on the consumers and the telephone department itself—service has improved and so has traffic and revenue per line. Says Pitroda: "This is one country where you don't need a market survey. You can't project demand in a traditional way."

Getting the RAX-a-day programme going has been a massive logistic exercise. Now the Department of Telecommunications (DOT) and C-DoT are gearing up to the task of installing the RAX system all around the country. the DOT is setting up its headquarters for maintenance and operations at Bangalore. Besides this, it also has other logistic problems to look after: training its staff, and providing buildings for the RAX systems in towns where they do not exist.

Meanwhile, C-DoT is also producing videos and a booklet to back up the round of training programmes which it is planning to hold. In the next few months it is planning one-day workshops for telecom planning officers at Bangalore and Delhi. Later C-DoT has also organised one-week courses in installation and maintenance for which two junior engineers from each telecom circle will be trained.

But the RAX is more than just a new more efficient system. It was designed specially for Indian conditions and can function in very high temperatures without air-conditioning. Moreover, it can also operate using very low power and even on batteries during power failures.

For the time being there is almost an unlimited demand for the RAX system. Pitroda estimates there are almost 50,000 towns and villages which could use the system. The 128 ports RAX will be installed over the next one year. But at the same time C-DoT's 4,5120-line and 2,000-line exchanges are being tested out in Delhi Cantonment and Ulsoor in Bangalore respectively. To start with, C-DoT is moving the RAX into towns which already have existing facilities such as buildings.

The RAX has already evoked interest from several Third World countries like Nepal, Kenya and Algeria where conditions are similar to those existing in India.

But for the time being C-DoT is not making any strong moves to sell abroad. But Pitroda is convinced that taking improved telecommunications to small towns in India will bear rich fruits, saying, "investment in telecommunications brings in more from rural areas." And hopefully those returns will begin to filter through as the telecommunications industry turns its attention for the first time to rural India.

/12913

PAKISTAN

Satellite Ground Station Operational in 2 Weeks

BK153688 Islamabad Domestic Service in Urdu 1500 GMT 29 Apr 88

[Text] The Pakistan Space and Upper Atmosphere Research Commission [SUPARCO] has completed the construction of a ground station for collecting data from weather satellites. The new station, currently being run on a trial basis in Karachi, will be fully operational during the next 2 weeks. The SUPARCO director said in an interview in Karachi today the station will receive cloud images from U.S. and Soviet weather satellites and analyze them. The station is equipped with special electronic instruments and monitors.

ITALY

Fiar Receiving Station for High-Speed Data Transmission Via Satellite

5500m289 Milan ITALIA OGGI in Italian 27-28 Feb 88 p 27

[Article by Paola Arosio: "High-Speed High Quality Images Via Satellite"]

[Text] Milan—Three-hundredths of a second. Within a few years, text and images will be sent to European cities via satellite in this almost unbelievably short period of time. Reception quality will be much higher than with the slow facsimile transmission on telephone wires. In fact, the images transmitted with the new system will be of such high quality that it will be possible, for example, to send to print immediately a newspaper page transmitted electronically. The transmission of text and images via satellite is part of the Apollo program, sponsored among other things by the EC and developed by ESA, the European Space Agency, with the goal of producing a system of high-quality, high-speed electronic transmission services.

An Italian firm, the Milan-based Fiar, will produce the receiving station for this system. The contract for this specific project within the framework of the Apollo program was signed at the end of 1987. Established 40 years ago and listed on the Milan stock exchange for the last couple of years, Fiar has recently shown great interest in space technology, with excellent results: 30 billion lire of the 1987 sales of 130 billion lire came from the space division.

Maurizio Ronsisvalle, head of Fiar's space and telecommunications division, explains it in these terms, "Everything is based on the Eutelsat satellite, which is already operational. Via the satellite, from one or more transceivers it is possible to broadcast to users equipped with this type of station vast quantities of data, absolutely identical with the original information, at 300 times the speed currently possible with the telephone network."

The possible applications of this system include the electronic transmission of daily newspapers, which could revolutionize work patterns and schedules by extending newspaper deadlines, and electronic image transmission. Ronsisvalle continues enthusiastically, "In addition, legal documents could be transmitted between two companies in the same firm. Consultation of databanks and centralized university and research institute libraries will be speeded up unbelievably."

With the satellite already installed, the time needed to produce the system will be short. "The transmission equipment has already been produced and installed in the major European cities within the context of the ESA programs," explains Ronsisvalle. "In Italy, for example, there are two, one in Rome and one in Milan, managed by SIP [Italian State-Owned Telephone Company]." Initially at least, firms wishing to take advantage of this service will have to link up with these stations via telephone in order to send their signals into space.

The missing link in the chain was the receiving station which, after one year of research conducted by a team of 10 Fiar researchers, will be produced in the form of three experimental prototypes within one year. "This is a small device (the antenna is approximately 2 meters in diameter) which can be installed on the roof of a house or in a garden," Ronsisvalle goes on to say. The device will cost approximately 40 to 50 million lire and can be used by more than one person.

However, the system also has its limitations: although satellite transmission occurs in much less than 1 second, the printers receiving the signal on the ground operate at a much slower rate.

Another limiting factor is the telephone connection with the receiving stations—"at least until high-speed telephone lines are installed," Ronsisvalle states.

But this is not the only satellite application that Fiar is studying for ESA: the prototypes for a mobile station for trucks are already prepared. The principle is the same: to create a satellite link for data between a transmitting station to a receiving station. However, in this case it is not images and documents but the voice of an operator which is sent via satellite, in order to inform drivers in real time of possible obstacles on the road, from accidents to unexpected landslides.

Truck and automobile drivers can also send messages to the central station, creating a vast network of generators of information concerning road conditions. "And the device is no bigger than an ordinary car radio," Ronsisvalle concludes.

08615

Selenia Reviews Microwave Applications in Radars

5500m291 Milan ALTA FREQUENZA in English No 10, Dec 87 pp 373-376

[Article by Raffaele Esposito of Selenia S.p.a.: "System Applications of Microwaves to Radars: Modern Trends"]

[Excerpt]

1. Introduction

Radar technology is presently facing a transition period, passing from the conventional design approach and configuration to the new era of digitally controlled systems, almost fully solid-state technology and adaptive operation, that are envisaged in the near future. Microwave technology has played a key role in almost all the past and present systems. The basic limits in the radar

operation are essentially due to the physical and technological performance (peak and average transmitted power, receiver noise, antenna gain, beam shape and sidelobe level) of the microwave sections of the radar. In addition to pursuing advance of the microwave technology, the current trend is to take advantage of the progress of different technologies, such as digital and optics, in order to create hybrid design where microwave, digital and optical devices are combined for the optimum systems performance. The objective of the present paper is to emphasize impact of microwave technology on the radar performance, analyse new trends and operational capabilities offered by technology advances, assess the validity of some old technologies and components and overview the modern approach to characterize the operational performance of the microwave components. A very high growth phase is not foreseen in the overall microwave equipment production, with an evident decline in consumer microwave market and a fast increase in EW. Microwave components and subsystems for radar are indicated as a stationary market, as far as conventional devices are concerned. The trend relative to the new technology devices will strongly depend on the system companies strategies, but opportunities appear to be attractive.

2. Microwave Components/Subassemblies and Radar

Radar and microwave technologies have been constantly interdependent and the evolution of the latter has followed the requirements of the radar systems. Consider, as an example, the requirements and the techniques for enhanced surveillance radar performance: it is evident the impact of the achievable performance of the microwave components and subassemblies on system design options. The two major requirements of survivability and detection are related to the reduction of probability of interception by ESM and ARM and to the capability of operation in heavy natural clutter and ECM. Additional requirements such as (i) target classification, (ii) adaptive phase, frequency and/or polarization, (iii) coded waveforms and (iv) radiation antenna characteristics, put more stringent requirements on tolerance, characteristics and operational performance of the pertinent microwave parts. Similar considerations can be made on the impact of the advanced characteristics of antenna, receiver front-end and transmitter on the performance of other radar types.

The current rate of development in the antenna field is very high and significant improvements are continuously being made in the performance and capabilities. A wide range of antenna configurations has been developed for radar systems, depending on the type of platform (ground based, naval, airborne, space), operating frequency range (from UHF to millimeter wavelengths), and the type of implanted function (surveillance and early warning, tracking, air traffic control, meteorological, 3D, multifunctional phased array, precision approach/GCA, maritime and coastal, SAR, altimeter).

Radar performance is strongly dependent on the antenna characteristics, as beam shape and width, sidelobe level, gain, polarization and beamwidth. Coverage requirements, site configuration, ECCM Radar performance prescribe radiative characteristics of the antenna in different directions. Specified beam shapes, possibly reconfigurable, can be accurately synthetized for both reflector (single or multiple) and array antennas. High efficiency is an important characteristic, in order to overcome the basic limitations in available transmitter power and receiver sensitivity. Polarization purity affects the level of cancellation of the radar echo with circular polarization. In tracking radars the cross polarization response of the antenna is also relevant for the radar error performance.

The integration of many microwave components has made possible the implementation of very compact multiple channel receivers for multifunction/multimode radars. In addition, advanced performances in terms of noise figure, bandwidth, dynamic range, phase stability, gain matching, have been transferred to better overall radar characteristics, without an appreciable cost impact. Microelectronics technology is a consolidated area with a high degree of repeatability.

Microwave tube transmitters represent the prevalent configuration in radar systems. Solid state technology is almost exclusively utilized in power supplies and the same trend is in modular switches and regulators. Grid-modulated TWT amplifiers have had a noticeable advancement, in terms of achievable phase stability, bandwidth of operation, duty cycle, power. This has been fully exploited in designing advanced, waveform modulated, frequency agile radars. Solid state power sources are becoming comparable alternatives to conventional microwave tubes in many applications. Continuous technological advances in bipolar transistors and, for higher frequencies, in field effect transistors (FET) make the "all-solid-state radar" dream feasible. By contrast, the low peak power of solid state sources calls for the transmission of long pulses, with high duty factors and chirp waveforms for successive pulse compression. This means that the replacement of microwave tubes is not a one to one exchange. At L-band, a "bulk" solid-state transmitter consisting of a number of combined individual modules of power amplifiers is comparable in terms of performance and costs to a microwave tube for the transmitter of a surveillance radar. Similar considerations can be made for the replacement of an S-band tube transmitter, even though the cost advantage becomes less evident. Typical advantages of the solid state solution are higher reliability/maintainability (relevant for the life cycle cost), graceful performance degradation for failures, use of low voltages. Furthermore, the concept of distributed power, solid state array antennas enables a more flexible control of both amplitude and phase distribution across the antenna aperture. A different approach to the use of the solid state sources is to feed parts of an array (as, for example, rows or columns) with a group of combined power amplifiers,

driven by a common source. The above configuration reduces the transmission line losses between transmitter and antenna and it is a first step toward the distributed power generation at the antenna aperture level.

4. Future Requirements and New Technologies

Advanced techniques are used in each major sub-system of the radar, but the present trend of evolution is mainly in the signal processing and microwave component technology.

Digital Beam Forming (DBF) technique implies the use of typical digital processing algorithms and tools, in order to obtain an adaptive or deterministic control of the multiple antenna patterns. With the present state of technology, by frequency down-conversion at the level of each radiating element, the A/D conversion and subsequent processing are transferred to frequencies below the microwave range. It can be foreseen that technology advancements will move the above functions into the microwave frequency area, thus allowing effective multifunction receiving operation.

Low probability of intercept (LPI) capability of a radar system is related to the use of low transmitted power spectral density and extremely low antenna sidelobe level (less than 45-55 dB below the peak level is a foreseen figure for future radars). Ultralow sidelobe level antennas (average level equal to or less than 20 dB/i) require, for example, phase and amplitude illumination distribution errors respectively less than 2 divided by 4 degrees and 0.2 dB. Long pulse coding and wide frequency agility, as additional LPI radar features, call for a new class of microwave components, beyond the present design status.

"Antistealth" capability of the radar is predicted as the most challenging requirements in the next future. By proper use of the shaping of the scattering structure and of absorbing and/or RF transparent materials, reduction of target radar cross section up to 10^{-2} divided by 10^{-4} square meters for medium/small size aircraft is foreseen. In addition to, or as an alternative to dedicated techniques, such as the use of very low or extremely high frequencies and/or very advanced signal processing techniques, the increase of the effective radiated power (transmitted power by antenna gain product) is a straightforward approach.

Adaptivity to the environment is essential in future radar systems. Present equipments have some limited degree of adaptivity, but the main limitations are in the technology and not in physical principles. The capability to adapt the radar characteristics to the surrounding environment will involve all the subsystems and the signal parameters (amplitude, phase, frequency, polarization, direction of arrival, time). The emerging concepts are based on a mix of new antenna configuration and existing processing techniques and they apply to arrays. The antenna is no more an isolated subassembly of the radar, but it is tightly connected with the signal processing. The new concepts, which permit better resolution for a given antenna size are a further attempt to reduce the physical dimensions of the only component that has not been significantly affected by the miniaturization trend of the electronic devices and components.

An attractive approach to enhance radar capabilities in terms of target identification, "antistealth" operation, range resolution appears to be the use of extremely broad bands. Studies are in progress and interesting results are anticipated. The new technique has obviously an enormous impact on all microwave components and subassemblies, since high directivity multioctave antennas have to be designed with new techniques, as well as transmitters and receivers. Among the new emerging technologies gallium arsenide (GaAs) (and related compounds field) is one of the most promising for the future evolution of radar systems.

Within the framework of the already established circuit configurations, the introduction of GaAs microwave monolithic integrated circuits (MMIC's) is having the effect of making more practical, and in some cases feasible, the realization of systems with known architecture.

With the continuous advancement of the GaAs MMIC technology, new and exciting prospectives in the field are made possible, by overcoming the traditional concepts of radar system design and by using at full the inherent potential of the GaAs technology. In fact the large bandwidth (more than two octaves) obtainable with MMIC design creates the possibility of realizing phased-array systems where it is possible to synthesize and control not only the shape and number of antenna beams, but also the waveform, the frequency and the transmitted power.

In this way the transreceiver system becomes a sensor which can be utilized simultaneously for more modes/functions.

08800

NORWAY

State Phone Agency Signs Contract for Digital Net Equipment

55002444 Oslo AFTENPOSTEN in Norwegian
12 Mar 88 p 45

[Article by Ulf Peter Hellstrom: "Telecontracts to STK"]

[Text] Standard Telefon Kabel (STK)/Alcatel has received development contracts from the Norwegian telephone company, Televerket, in connection with the further upgrading of the public digital telenet to a net that delivers both telephone conversations and data signals. The contracts have a total value of 113 million kroner, AFTENPOSTEN has learned. Televerket has

come a long way toward replacing today's telenet and telephone exchanges with equipment that delivers information as digital signals. This modernization of the whole public net is a big effort that will continue for many years.

STK delivers System 12 telephone exchanges, which up to now have been the backbone of this modernization. Now the Oslo company will also be a significant factor in the further development of Televerket's services in the coming years.

All in One

ISDN is an English abbreviation for a so-called integrated service data network that delivers both speech, text, data, and picture in the same net. Both the data signals and the telephone conversations can be delivered from the same contact in the wall. Televerket has long been prepared for such a net to become the next step in the development of future teleservices.

The first trial net will be delivered to Televerket as early as the spring of next year. The trial net will have exchanges in Oslo, Trondheim, and Grimstad. These trial exchanges will not carry public traffic.

Pilot Deliveries

STK has already begun developmental work that will lead to pilot deliveries of advanced program packages. The programs will be connected to System 12 exchanges. The goal is to development technology that makes it possible to build up a service-integrated net on a routine basis.

09124